Remarks/Arguments

In response to the Rejection mailed December 15, 2004, applicants have amended claims 70, 79, 82, 83 and 84 and present new claim 88 and the following remarks.

Claims 82-84 were rejected under 35 USC 112, second paragraph as lacking antecedent basis for "the ... step". These claims are dependant on claim 79. The word "steps" is supported by line 2 of claim 79 which should have provided antecedent basis for each step. Nonetheless, the informal language has been removed.

Claims 70 and 79-87 were rejected under 35 USC 103 as being unpatentable over one of four Garger et al patents in view of Koprowski et al and Francon et al. The examiner considered Garger et al to teach the initial steps of the claimed method except for the final virus purification by polyethylene glycol/salt precipitation followed by solvent extraction. The examiner notes that Gooding et al (incorporated by reference in Garger et al) discloses solvent extraction followed by polyethylene glycol precipitation. Koprowski et al was cited to show precipitation by 4% polyethylene glycol (MW 15,000-20,000) and 50 mM NaCl. Francon et al was provided to teach lyophilizing an aqueous phase containing virus to store the virus. From these, the examiner contends it obvious to use the solvent extraction and polyethylene glycol/salt precipitation steps in the Garger et al method. This rejection is respectfully traversed.

The rejection is defective for at least five reasons. Accordingly, the rejection should be withdrawn.

First, no reference or combination of references teaches using a solvent extraction after a polyethylene glycol/salt precipitation. The only reference teaching solvent extraction of virus, Gooding et al, performs the extraction before polyethylene glycol (alone, no salt) treatment. The order of the two procedures is reversed in the present claims. Also, polyethylene glycol/salt precipitation is somewhat different from simple polyethylene glycol without salt. Even combining all of the other references, one still has the wrong order of procedures.

Second, Koprowski et al treats a very different liquid with their polyethylene glycol/NaCl solution. In Koprowski et al, biological material has been frozen, ground and particles centrifuged out. See Example 1. All of these are physical steps of solid removal, no chemical treatment has occurred before polyethylene glycol/NaCl treatment. By contrast, the claimed invention requires a chemical treatment before polyethylene glycol/NaCl precipitation. The differences should not be surprising because Koprowski and the present invention have different goals of purifying different things. One would not be motivated to add a purification technique that was previously used on a different material.

Third, Gooding et al (in Garger et al) treats a different type of material with their solvent treatment. Gooding et al treats simple homogenized plant material. By contrast, the present invention has chemically treated homogenized plant material by multiple chemical treatments (by six claimed steps) before adding solvents to extract purified virus. Again, one would not be motivated to add a purification technique that was previously used on a different material.

Fourth, the concentration of salt used in the present invention is much greater than that used in Koprowski et al. This results in a greater ionic strength in solution and affects solubility of certain materials. At the end of Koprowski et al example 1, the only teaching of using polyethylene glycol and salt together, Koprowski et al states "Polyethylene glycol is a component that precipitates virus particles." No mention was made that salt participates in or affects the precipitation process. Koprowski et al use 50 mM NaCl. By contrast, the present specification on page 17, line 27, page 18 line 22 and the presently amended claims, recite using about 4% NaCl. This amount is about 12 fold higher than that used in Koprowski by my calculations.

Fifth, while one may ordinarily consider it obvious to combine separate known purification techniques together, such as those of Koprowski et al and Francon et al. However, Garger et al presents a problem to combining a solvent extraction to their taught purification method because one cannot consider it obvious to do so when Garger et al specifically teach not to do so. Garger et al specifically instructs their readers to avoid using organic solvents. See column 3, lines 52-53,"...*using solvents in a large-scale purification*

is problematic." and column 9, lines 56+, "*Plant protein and peptide isolation procedures in the prior art frequently use solvents such as n-butanol, chloroform and carbon tetrachloride to eliminate chloroplast membrane fragments, pigments and other host related materials. Such methods are not easily practiced on a large and commercially valuable scale since these methods often require designing special equipment...*" Garger et al designed their virus purification technique to avoid the organic solvents. Therefore, one would be motivated to avoid adding an organic solvent extraction procedure to the taught Garger et al process. One cannot combine such a procedure with the Garger et al process when Garger et al specifically teach against such a procedure.

In view of the amendments and comments above, the rejection has been overcome. Reconsideration, withdrawal of the rejection and early indication of allowance are respectfully requested. If any issues remain, the examiner is encouraged to telephone the undersigned.

If needed, applicants petition for an extension of time under the provisions of 37 CFR 1.136(a) for sufficient time to accept this response. The commissioner hereby is authorized to charge payment of any fees under 37 CFR § 1.17, which may become due in connection with the instant application or credit any overpayment to Deposit Account No.500933.

Respectfully submitted,

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